

WE have the pleasure of congratulating Mr. T. Southwell, of Norwich, on the appearance, in the February number of the *Zoologist*, of the twentieth annual issue of his valuable "Notes on the Seal and Whale Fishery." The season's catch included 16 whales, 494 walruses, 53 seals and 145 bears, which yielded 230 tons of oil and 219 cwt. of whalebone; in addition to which was the product of 1 whale, 138 walruses and 3400 seals, equal to 60 tons of oil and 10 cwt. of "bone" from the Cumberland Gulf station. With oil at 22s. per ton, and sizable "bone" at 1400s. per ton, the estimated value of the take would be about 30,000s., as against 38,000s. in 1899. Owing to the bays in which they are usually beached being blocked with ice, no white whales were taken. Mr. Southwell is informed that the Greenland seas are not to be visited by any British whalers during the coming season. Commenting on the practical disappearance of the right whale from the Greenland seas, the author doubts whether this can be attributed to extermination, but is at a loss to determine where the remnant have gone. "As to the seals, the case is much more simple; the destruction year after year of a very large proportion, often virtually of the whole brood and of a large number of old seals in addition, congregated in a limited area, must inevitably tell in course of time, and sooner or later reduce the breeding pack to such an extent that they would be no longer worth pursuing, and even lead to their final extermination. This has doubtless, to a very large extent, been the case. The British vessels have quite abandoned the pursuit, and what there is left of the Greenland sealing is now quite in the hands of the Scandinavians, whose more economical outfits enable them to continue the struggle long after we have been driven from the field."

A BULKY volume just issued by the Government of India contains accounts of the trade carried by rail and river in India in the official year 1899-1900 and the four preceding years, compiled under the direction of the director-general of statistics.

A COLLECTION of tables showing the rainfall recorded on each day of every month from 1868 to 1899 at Dehra Dun has been issued by the Survey of India Department. The daily, monthly and annual means are also given.

THE following lectures will be given at the Royal Victoria Hall, Waterloo Road, during April, on Tuesday evenings:—"Waves and Oscillations," Mr. A. W. Porter; "Wild Nature at Home," Mr. R. Kearton; "Arctic Discovery," Captain Wiggins; "Our Field Crops as a Factory of Food," Mr. J. S. Dymond; "Facts about India: Plague and Famine," Mr. Birdwood.

WE have received a copy of *Kuhlows German Trade Review and Exporter*. This paper is published in Berlin but is written in English, and contains some interesting translations from German and other technical papers on recent electrical work. The main object of the journal is to introduce German productions to foreign markets, and it is noteworthy as an example of the energy and perseverance with which the Germans are pushing their export trade.

THE *Rendiconto* of the Bologna Academy (iii. 1) contains a paper, by Prof. Ferdinando Paolo Ruffini, on the moments of inertia of a system of points not possessing a mass centre. The author examines, with the aid of certain formulæ already indicated by the late Prof. Beltrami, the disposition in space of the axes which in a given system of points having no mass centre (the sum of the mass constants being zero) have a given moment of inertia. The quadrics which are analogous to the ellipsoids of inertia in an ordinary system are also discussed.

IN a recent number of the *Revue générale des Sciences* Prof. A. Haller describes the contact process of sulphuric acid manufacture as used by the Badische Anilin- und Soda-Fabrik. In

this process a mixture of sulphur dioxide and air is brought into contact with platinised asbestos at the proper temperature. The platinised asbestos is placed on perforated trays, supported in an upright tube which is so arranged that it can be heated or cooled by means of a current of air. The temperature at which the best results may be obtained depends upon the concentration of the sulphur dioxide and must be sufficiently high to start the reaction, but lower than the dissociation temperature of sulphur trioxide. A similar process has been in operation for a considerable time in this country and in Germany for preparing "Nordhausen" acid, but it has been found only workable when the mixture of sulphur dioxide and oxygen is pure, such as the mixture obtained from sulphuric acid by dropping it on to hot platinum. Presence of water vapour and other impurities causes the platinised asbestos to become inactive. In the Badische Fabrik process the sulphur dioxide is obtained by burning pyrites, and complete combustion of the sulphur and other oxidisable matter is attained by blowing jets of air and steam into the hot gas just as it issues from the burners. The gas is then washed and dried by passing through sulphuric acid. Before passing into the "contact" apparatus the mixture is examined optically, and must show no trace of cloudiness when viewed through a long tube. It is also chemically examined and must be free from arsenic. By proper regulation of the temperature up to 99 per cent. of the sulphur dioxide is converted into sulphur trioxide. The sulphur trioxide is dissolved in water, and for the production of acid of higher concentration than 60 per cent. the process is more economical than the lead chamber method. The claim is also made that better acid is produced, since it contains no arsenic, nitric compounds or lead.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus*) from India, presented by Mrs. F. Page; a Green Monkey (*Cercopithecus callitrichus*) from West Africa, presented by Mrs. Horrell; a Senegal Touracou (*Turacus persa*), a Great-billed Touracou (*Turacus macrorhynchus*) from West Africa, presented by Mr. G. A. Corder; a Goshawk (*Astur palumbarius*), European, presented by Mr. C. Schaible; four Chameleons (*Chamaeleon vulgaris*) from North Africa, presented by Mr. W. F. Cornelius; a Lesser White-nosed Monkey (*Cercopithecus petaurista*) from West Africa, a Grey Ichneumon (*Herpestes griseus*) from India, deposited; a Tasmanian Wolf (*Thylacinus cynocephalus*) from Van Dieman's Land, received in exchange.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN APRIL.

- April 1. 15h. 56m. Transit (egress) of Jupiter's Sat. III.
 2. 8h. 23m. Minimum of Algol (β Persei).
 3. 18h. 0m. Mercury at greatest elongation, $27^{\circ} 48'$ West.
 4. 11h. 59m. to 13h. 18m. Moon occults B. A. C., 4531 (mag. 5.7).
 7. 15h. 59m. to 17h. 19m. Moon occults ω^2 Scorpii (mag. 4.6).
 7. 16h. 5m. to 16h. 20m. Moon occults ω^1 Scorpii (mag. 4.1).
 15. Saturn. Outer minor axis of outer ring = $15''.96$.
 15. Venus. Illuminated portion of disc = 0.998.
 15. Mars. Illuminated portion of disc = 0.924.
 20-21. Epoch of Lyrid meteoric shower (Radiant $270^{\circ} + 33^{\circ}$).
 22. 10h. 5m. Minimum of Algol (β Persei).
 22. 10h. 25m. to 11h. 11m. Moon occults χ^2 Orionis (mag. 5.9).
 27. 7h. 40m. to 8h. 31m. Moon occults ρ Sextantis (mag. 6.0).
 30. 10h. Jupiter stationary.

NEW VARIABLE STARS.—Mr. Stanley Williams announces the discovery of a new variable star in Perseus having the position

$$\left. \begin{array}{l} \text{R.A.} = 3\text{h. } 17\text{m. } 51\cdot8\text{os.} \\ \text{Decl.} = +43^{\circ} 39' 55\cdot6'' \end{array} \right\} (1855).$$

The star is B.D. $+43^{\circ} 726$, catalogued as 8·9 magnitude, and is in the same field as Nova Persei with a low power.

The following magnitudes have been determined from photographs obtained with a 4·4-inch portrait lens.

1900.	Dec. 22	...	11·63 Mag.
1901.	Jan. 11	...	11·47
	25	...	10·97
	Feb. 11	...	10·87
	20	...	10·80
	28	...	10·53

The visual magnitude of this star is considerably brighter than the above photographic measures. Espin classes the star R in his "Stars with Remarkable Spectra."

Dr. T. D. Anderson announces a new variable in Andromeda, whose position is

$$\left. \begin{array}{l} \text{R.A.} = \text{oh. } 43\cdot5\text{m.} \\ \text{Decl.} = +33^{\circ} 35' \end{array} \right\} (1855).$$

The magnitude of the star has varied as follows:—

1900.	Oct. 5	...	< 11·2
1901.	Feb. 16	...	10·7
	March 10	...	10·2.

Astronomische Nachrichten (Bd. 155, No. 3698).

LIGHT CURVE OF ALGOL.—Prof. A. A. Nijland, of Utrecht, contributes an article to the *Astronomische Nachrichten* (Bd. 154, No. 3695), containing the results of a numerous series of determinations of the brightness of Algol during its variation, and gives the light curve deduced therefrom. As shown, the variation is not symmetrical with respect to the minimum, a break occurring on the passage from maximum to minimum.

CHART FOR OBSERVATIONS OF NOVA PERSEI.—The first of a series of charts for use in observations of Nova Persei has been prepared by Father Hagen, of Georgetown College Observatory, and has recently been issued. The publication consists of a map of the region surrounding the Nova, showing stars down to the sixth magnitude, and a catalogue including all the stars shown on the chart, with their actual magnitudes and notes as to any peculiarities. A second series of charts is in preparation, and will be issued shortly.

PHOTOGRAPHY OF THE AURORA.

THE ever-changing form, and the faintness, of the aurora render this phenomenon a difficult subject to the photographer. Many have been the attempts to secure photographs of what have appeared to be brilliant displays, but the results have shown that little or no action had taken place on the photographic film, in spite of the fact that very rapid plates had been used. Herr Tromholt, who made a special study of the photography of the aurora, exposed very rapid plates to what he considered bright aurora, and even with exposures from 4–7 minutes secured no trace of them. Later, at Christiania, he was more fortunate, and obtained an impression with an exposure of 8·5 minutes. To advance our knowledge of the changes in form of this phenomenon, it is important that photographs should be secured, if possible, in a few seconds, and not minutes. This seems now to be feasible, judging from an interesting account given in the *Meteorologische Zeitschrift* (Heft 6, 1900), by Herr O. Baschin. Herren Brendel and Baschin stayed several months, during the winter of 1891–92, at Bossekop, in Norwegian Lapland, to study the magnetic elements and the aurora.

For the photography of the aurora they employed an apparatus belonging to Herr O. Jesse, who had used this instrument for photographing luminous night clouds. The objective had a focal length of 210 mm. and 60 mm. aperture; the dimensions of the plates used were 9 × 12 cm., the field photographed covering about 20° to 30°. Schleussner's plates were employed, and what appears to be the most important desideratum, the plates were stained (with erythrosine) and thus rendered more

sensitive to the auroral light. For the first experiments the exposures given were comparatively long, namely three minutes, but these were found to be excessive; finally, seven seconds were sufficient to give good pictures. The reproductions accompanying the account of these researches illustrate the results secured with exposures of one minute and seven seconds respectively. The latter is reproduced here and shows very clearly the drapery-structure, although even this, according to Herr Baschin, is overexposed, the structure having a watery



FIG. 1.—Auroral-drapery on February 1, 1892.

and not sharp appearance. With such first results as these, there seems no reason why, with plates stained to be most sensitive to the particular colour of the aurora, and with the most rapid lenses, even shorter exposures of a second or less should not be given.

A step in the right direction has, however, been made, and the time is not far off when it will be as possible to project the ever-changing form of the aurora upon a screen as it is to exhibit in this way the phenomenon of an eclipse of the sun.

THE MISSISSIPPI RIVER.

THE Mississippi river, extending over a length of 2550 miles, has been placed by the United States Government under the charge of a Commission, whose duties include the making of a detailed survey of the channel from the headwaters to the Gulf of Mexico; a topographical survey showing the natural and artificial features lying within a mile of the river; a system of triangulation with base lines along the stream; longitudinal and cross sections of the channels; observations and records as to floods; and, for the assistance of future surveys, the placing, at intervals of three miles, of permanent marks, consisting of four stone or vitrified tile monuments placed in a line normal to the stream, two on each bank, about half a mile apart. The Commission has also the charge of the works carried out for regulating and deepening the channel.

Mr. J. A. Ockerson, who is a member of this Commission, and who, in the year 1899, made a survey of the headwaters of the Mississippi, contributed a paper on the subject to the *Proceedings of the International Congress on Navigation* held at Paris last year,¹ from which the principal part of the information here given has been obtained.

¹ "The Mississippi River: Some of its Physical Characteristics and Measures employed for the Regulation and Control of the Stream." By J. A. Ockerson, member of the U.S. Mississippi Commission Eighth Navigation Congress on Navigation. Recorded in English and French. (Paris 1900.)